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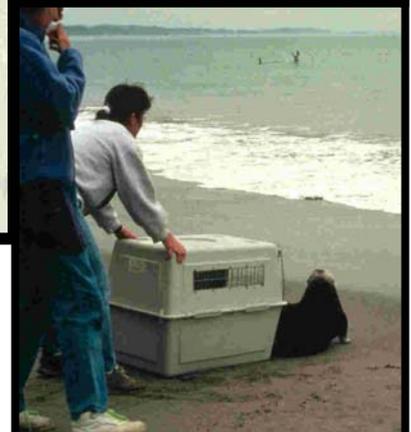
Draft Evaluation of the Southern Sea Otter Translocation Program 1987-2004

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Evaluation of the



Southern Sea Otter Translocation Program 1987-2004



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Executive Summary

In 1982, we, the U.S. Fish and Wildlife Service (Service) identified the translocation of southern sea otters (*Enhydra lutris nereis*) as a critical recovery action for the species. At the time, the southern sea otter's range was limited to the central California coast, and the prospect of a large-scale oil spill was considered to be the sea otter's greatest threat (USFWS 1982). The intent of translocation was to establish one or more southern sea otter colonies in habitat occupied by southern sea otters prior to their decimation by the Pacific maritime fur trade (1784-1911). The creation of additional colonies was expected to reduce the risk that all southern sea otters would be lost in a single catastrophic event.

The southern sea otter is protected by the Endangered Species Act of 1973 (ESA) and the Marine Mammal Protection Act of 1972 (MMPA). Prior to amendment of the MMPA in 1988, these Acts differed with respect to the establishment of experimental (or translocated) populations. In the case of southern sea otters, special legislation was passed specifically to authorize translocation. Public Law (P.L.) 99-625 allowed the Service to implement a southern sea otter translocation program, while also requiring the Service to implement a southern sea otter management strategy intended to minimize conflict between the experimental sea otter population and shellfish fisheries. The Service was instructed to capture and remove all sea otters within a management zone surrounding the translocation zone. The capture and removal of sea otters was intended to contain the new sea otter colony and to prevent sea otters from establishing colonies in the newly designated "no otter" management zone.

Subsequent to the passage of P.L. 99-625, we completed an environmental impact statement that evaluated several translocation sites and included a southern sea otter translocation plan (USFWS 1987). San Nicolas Island, an island approximately 60 miles offshore of southern California, was selected as the preferred translocation site. From 1987 to 1990, 140 southern sea otters were moved to the island from the central coast of California. By the end of 2004, the sea otter colony at San Nicolas Island numbered about 32 animals.

This document evaluates the southern sea otter translocation program by comparing results to date with the program's objectives and specific failure criteria established at the program's inception. Based on this evaluation, we conclude that the southern sea otter translocation program has failed to fulfill its primary purpose as a recovery action and that our recovery and management goals for the species cannot be met by continuing the program. This determination is based on the following grounds:

- 1) the colony of southern sea otters at San Nicolas Island is small, and its ability to become established and persist is uncertain;
- 2) establishment and maintenance of an isolated southern sea otter colony at San Nicolas Island will not provide an adequate safeguard should the mainland southern sea otter population be adversely affected by a catastrophic event;
- 3) the recovery strategy for the southern sea otter has changed since the original recovery plan for the species was released in 1982; in the revised Southern Sea Otter Recovery Plan (USFWS 2003), the recovery team recommended that we declare the

- translocation program a failure and discontinue maintenance of a “no-otter” management zone;
- 4) attempts to limit natural range expansion of southern sea otters will disrupt seasonal patterns of movement and hinder recovery of the southern sea otter;
 - 5) capturing and moving sea otters out of a “no-otter” management zone has proven to be ineffective as a long-term management action, largely because of the difficulties inherent in sea otter capture, the ability of sea otters to return rapidly to the management zone, and the elevated mortality associated with the holding, transport, and release of sea otters.

Background

On January 14, 1977, we, the U.S. Fish and Wildlife Service, listed the southern sea otter as a threatened species under the ESA [16 U.S.C 1531 *et seq.*] on the basis of its small population size, its greatly reduced range, and the potential risk of oil spills [42 FR 2968]. We established a recovery team for the species in 1980, and we approved a recovery plan for the species on February 3, 1982 (USFWS 1982). In the recovery plan, we identified the translocation of southern sea otters as an effective and reasonable recovery action, acknowledging that a translocated southern sea otter population could impact shellfish fisheries that had developed in areas formerly occupied by southern sea otters. The objectives of southern sea otter translocation, as given in the 1982 recovery plan, included: (1) establishing a second colony (or colonies) sufficiently distant from the parent population such that a smaller portion of the southern sea otter population would be jeopardized in the event of a large-scale oil spill; and (2) establishing a database for

identifying the optimal sustainable population level for the southern sea otter. We anticipated that translocation would ultimately result in a larger population size and a more continuous distribution of animals throughout the southern sea otter’s historic range.

Section 10(j) of the ESA specifically authorizes translocation of a listed species to establish experimental populations. However, the southern sea otter is protected under both the ESA and the MMPA, and at the time, the MMPA did not contain similar translocation provisions. This inconsistency was resolved in the case of the southern sea otter by the passage of P.L. 99-625 (Fish and Wildlife Programs: Improvement; Section 1. Translocation of California Sea Otters) on November 7, 1986, which specifically authorized development of a translocation plan for southern sea otters administered in cooperation with the affected State.

The Congressional Record for P.L. 99-625 provides insight into the purpose of this legislation [H.R.4531]. Authorization for the translocation of southern sea otters was clearly prompted by a desire to protect the species and to promote its recovery. However, Congress also recognized the potential for conflict between a translocated sea otter population and fisheries and other resource uses. To address this concern, Congress included in P.L. 99-625 a requirement that any southern sea otter translocation plan authorized under this legislation must include the designation of a management zone that would surround the translocation zone. Sea otters entering the management zone were to be captured using non-lethal means and moved outside the management zone.

If the Secretary of the Interior chose to develop a translocation plan under P.L. 99-

625, the plan was to include: (1) the number, age, and sex of southern sea otters proposed to be relocated; (2) the manner in which southern sea otters were to be captured, translocated, released, monitored, and protected; (3) specification of a zone into which the experimental population would be introduced (translocation zone); (4) specification of a zone surrounding the translocation zone that did not include range of the parent population or adjacent range necessary for the recovery of the species (management zone); (5) measures, including an adequate funding mechanism, to isolate and contain the experimental population; and (6) a description of the relationship of the implementation of the plan to the status of the species under the ESA and determinations under section 7 of the ESA. The purposes of the management zone were to: (1) facilitate the management of southern sea otters and containment of the experimental population within the translocation zone; and (2) prevent, to the maximum extent feasible, conflicts between the experimental population and shellfish fisheries within the management zone. Any sea otter found within the management zone was to be treated as a member of the experimental population. We were required to use all feasible non-lethal means to capture sea otters in the management zone and to return them to the translocation zone or to the range of the parent population.

In May 1987, we published a final environmental impact statement that analyzed the impacts of establishing a program to translocate southern sea otters from their then-current range along the central coast of California to the northern coast of California, the southern coast of Oregon, or San Nicolas Island off the coast of southern California. We identified translocation to San Nicolas Island as our preferred alternative. A detailed

translocation plan meeting the requirements of P.L. 99-625 was included as an appendix to our 1987 environmental impact statement. Also in August of 1987, we published implementing regulations for the translocation program [52 FR 29754; 50 CFR 17.84(d)]. These regulations define the translocation and management zones, provide the framework for the program, and include a set of criteria for determining if the translocation should be considered a failure.

On August 24, 1987, we began to implement the translocation plan by moving groups of southern sea otters from the coast of central California to San Nicolas Island. In December 1987, in coordination with the California Department of Fish and Game, we began capturing and moving sea otters that entered the designated management zone.

Translocation Program Purpose, Objectives, and Expectations

*The U.S. Fish and Wildlife Service issues a final rule governing a reintroduction of southern sea otters (*Enhydra lutris nereis*) at, and containment of them in the immediate vicinity of, San Nicolas Island, Ventura County, California for two purposes:*

- (1) To implement a primary recovery action for a federally listed "threatened" species; and,*
- (2) to obtain data for assessing translocation and containment techniques, population dynamics, the ecological relationships of sea otters and the near shore community, and the effects on the donor population of removal of individual otters for translocation.*

52 FR 29754; August 11, 1987

As is evident in the final rule on the translocation of southern sea otters, the primary purpose of the translocation program was to bring southern sea otters closer to recovery and eventually to delisting as a threatened species. Through translocation, we hoped to establish a self-sustaining southern sea otter population (experimental population) that would provide a safeguard in the event that the parent southern sea otter population were to be adversely affected by a catastrophic event, such as an oil spill.

Recovery Objectives

The translocation plan allowed for a maximum of 70 sea otters to be moved to San Nicolas Island during the first year of the program (USFWS 1987). This number could be supplemented with up to 70 animals annually in subsequent years, if necessary (up to 250 total), to ensure the success of the translocation and to prevent the founding population from declining into an irreversible downward trend. The intent

was to ensure that a minimum of 70 sea otters would form the nucleus of a breeding colony that would eventually grow toward the carrying capacity of the environment.

The population growth of the San Nicolas Island colony as anticipated in the translocation plan is shown in Figure 1. The growth rate of the new colony was expected to be between 5 and 15 percent per year. According to the translocation plan, the experimental population at San Nicolas Island would be considered established when at least 150 sea otters resided within the translocation zone and the population had a minimum annual recruitment of 20 animals. A population of this size was expected to be sufficient to supply up to 25 immature southern sea otters per year for several years should it become necessary to replenish the parent population after a catastrophic event such as an oil spill. Assuming that a core population of 70 southern sea otters could be maintained through translocation, we anticipated that

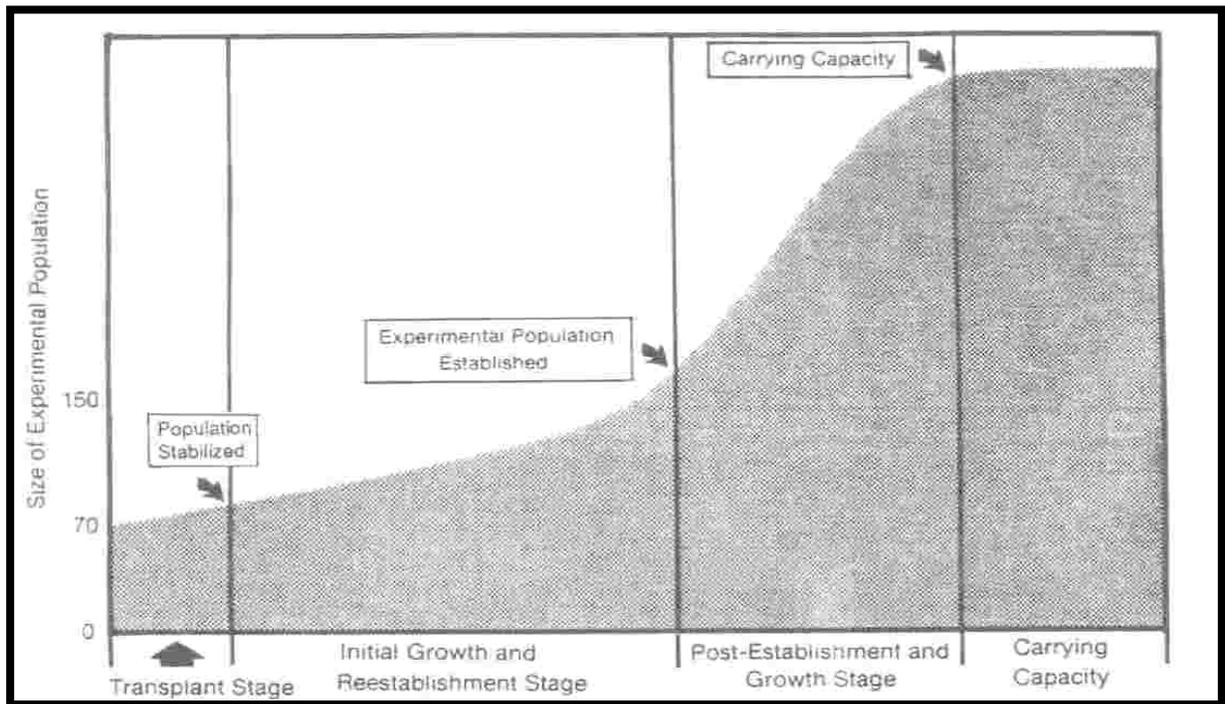


FIGURE 1. EXPECTED POPULATION GROWTH OF THE SAN NICOLAS ISLAND COLONY.

the experimental population could be established within as few as 5 or 6 years. Once established, the experimental population was expected to continue to grow, eventually reaching the lower bound of the estimated carrying capacity of the habitat (believed to be approximately 280 animals; USFWS 1987) after 10-15 years.

Containment Strategy

P.L. 99-625 allowed for the translocation of southern sea otters with the provision that a sea otter management zone be established around the translocation zone. The management zone was intended to isolate the experimental population and to limit potential impacts of the experimental population on existing commercial fisheries. Southern sea otters found within the management zone were to be captured using non-lethal techniques and relocated to the parent or experimental population. Both the California Department of Fish and Game

and the Marine Mammal Commission advocated this approach, also known as zonal management. Public Law 99-625 states that any sea otter found in the designated management zone is to be considered a member of the experimental population, regardless of whether the animal entered the management zone from the translocation zone or from the parent population. However, it is clear, based on Congressional testimony and the final rule [52 FR 29754; August 11, 1987], that southern sea otter removal activities were expected to focus on animals dispersing from the translocation zone.

After consultation with the California Department of Fish and Game, we defined the sea otter management zone to include the coastline from Point Conception to the Mexican border and all of the offshore islands except San Nicolas Island (Figure 2). This management zone created an artificial

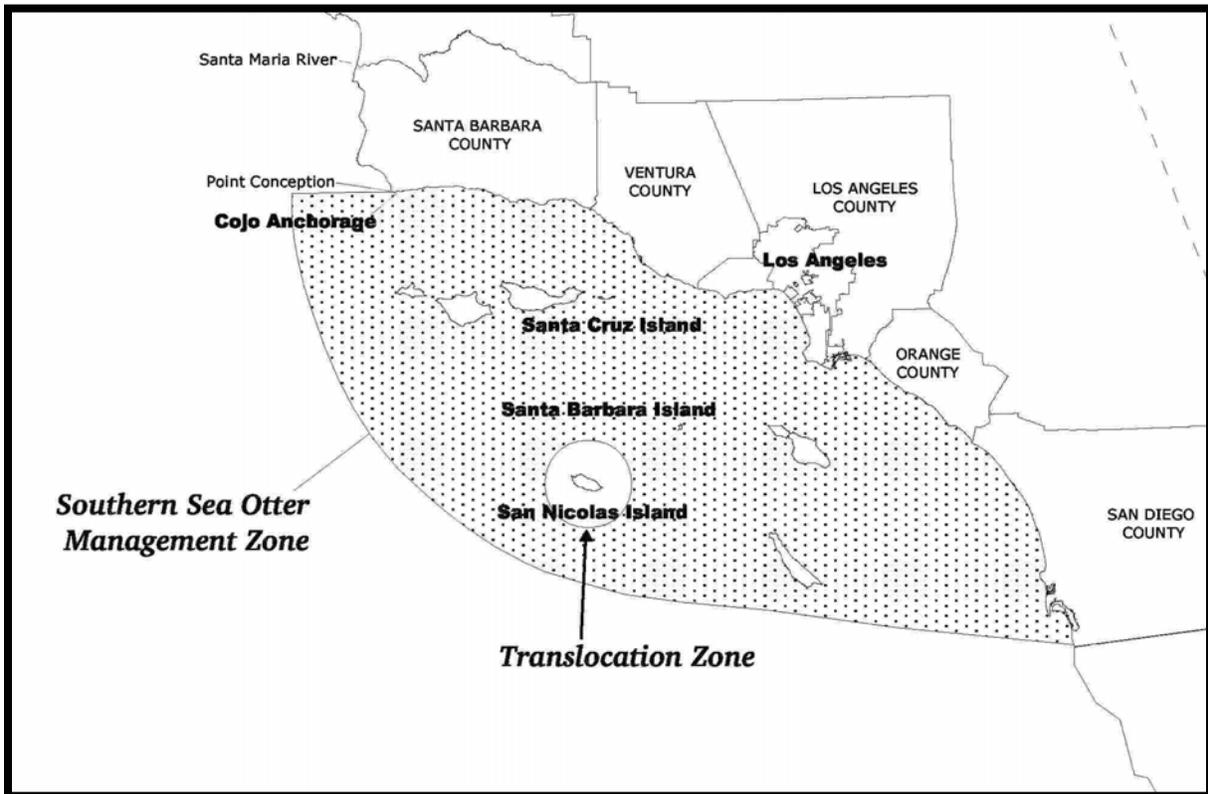


FIGURE 2. TRANSLOCATION AND MANAGEMENT ZONES.

southern barrier for the parent population that was to be maintained as long as the translocation program was in effect.

The translocation plan called for the Service and the California Department of Fish and Game to enforce the management zone jointly. We relied on sightings and location reports from other federal and state agency personnel, fishermen, boat skippers, and the general public. To this end, we publicized a sea otter hotline (Figure 3), which we hoped would allow us to receive reports of sea otters in the management zone in a timely manner. Upon verification of a sea otter sighting, field crews were mobilized to capture sea otters and transport them to areas outside the management zone.

Ultimately, it was recognized that the long-term feasibility of non-lethal sea otter containment would be dependent on the availability of adequate release sites outside of the management zone. Participants in a workshop convened by the Marine Mammal Commission in October 1984 noted that sea otters ultimately could reach carrying capacity within designated sea otter zones and that the continuation of zonal management under such circumstances would require some form of culling or birth control (Marine Mammal Commission 1985). Artificial control of fecundity (birth control) and selective or random non-lethal removal of sea otters residing in the translocation zone were included as reserve clauses in the regulations implementing P.L. 99-625 as possible containment measures, although the area to which sea otters might be removed was not specified [50 CFR 17.84(d)]. In the final rule for the southern sea otter translocation program, we clearly stated that we had no intention of using these population limiting techniques until the southern sea otter

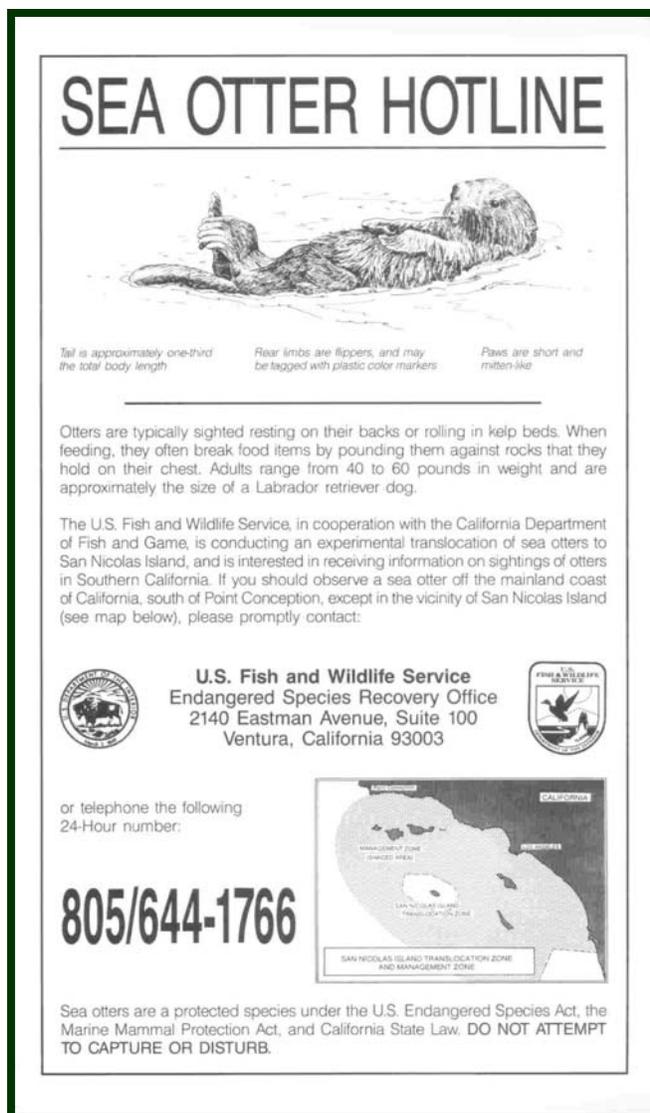


FIGURE 3. SEA OTTER HOTLINE POSTER.

population was fully recovered, and then only after consultation with the California Department of Fish and Game, the Marine Mammal Commission, and the interested public [52 FR 29754].

Summary of the Sea Otter Translocation Program (1987-2004)

Southern sea otters were translocated to San Nicolas Island from August 1987 to July 1990. During this period, 252 sea otters were captured along the central California

coast, but only 139 were actually translocated to San Nicolas Island (USFWS 1995, Rathbun *et al.* 2000). More than 100 southern sea otters were deemed unsuitable for translocation based on their age, sex, or general health; these animals were released near their capture sites. At least 6 of the 252 sea otters captured died of stress-related conditions while being held prior to their transport to San Nicolas Island. One rehabilitated southern sea otter pup (found orphaned on the central coast of California and cared for by the Monterey Bay Aquarium) was also released at San Nicolas Island, bringing the total number of sea otters released at the island to 140.

All sea otters translocated to San Nicolas Island were flipper-tagged using color-coded tags. In addition, a passive integrated transponder (PIT) tag unique to each animal was inserted under the skin of each translocated sea otter. Many of the sea otters taken to San Nicolas Island were also fitted with radio transmitters to track their movements. The primary purpose of the tagging and radio telemetry efforts was to assist in collecting data called for in the translocation plan, including information on population dynamics and ecological relationships between sea otters and the nearshore marine community. A secondary purpose was to locate and track sea otters that left the translocation zone.

Translocation Results

During the first year of translocation efforts (August 1987–July 1988), 69 sea otters were translocated to San Nicolas Island, but only 20 were observed at the island by the end of the period. Three of the 69 animals died at San Nicolas Island, 2 were found dead on the mainland (1 had been shot), 3 were suspected to have been killed in fishing gear, and 1 was recaptured and removed from the management zone (Rathbun *et al.* 1990).

Forty animals were missing and were presumed to have dispersed from the translocation zone because there was no evidence of additional mortality at the island. Emigration from San Nicolas Island was higher than anticipated given the abundant food resources available to sea otters there, the island's overall habitat quality, its isolated location, and the presumed barrier afforded by the deep waters surrounding it.

During the first year of the project, captures of sea otters for translocation to San Nicolas Island were less efficient than expected. Sea otters became wary after exposure to intense capture activities (dip netting) in their home territories. Their wariness affected the ability of capture teams to select specific individuals and increased the time needed to obtain the proper number and composition of sea otters for translocation. Capture delays imposed additional stress on animals awaiting translocation in holding tanks and contributed to the deaths of four sea otters before they could be translocated (USFWS 1988).

Because of the unexpected mortalities and high emigration encountered during the first year, we amended our regulations for the translocation program in 1988 [53 FR 37577; September 27, 1988]. The amendments were intended to minimize stress on sea otters, to improve the survival of translocated animals, and to minimize dispersal of sea otters from the translocation zone. Specifically, we provided more flexibility in selecting the ages of sea otters for translocation, eliminated the restriction to capture sea otters only within an August to mid-October time frame, eliminated the requirement to move a specified number of southern sea otters previously implanted with transmitters, provided the flexibility either to transport sea otters immediately or

to hold them on the mainland before releasing them at San Nicolas Island, and eliminated the requirement to translocate a minimum of 20 sea otters at a time. Based on data collected during the first year of translocation, we believed that younger sea otters were more likely to remain at San Nicolas Island (Rathbun *et al.* 1990).

The second year of the translocation effort focused on the translocation of younger sea otters. These animals were transported in smaller groups (1 to 4 animals) to minimize the time they were held in captivity. Once at the island, they were immediately released from shore in the vicinity of other sea otters. By the end of the second year, a total of 126 sea otters had been moved to San Nicolas Island, but only 17 were observed at the island (USFWS 1989, USFWS 1990). Even with modifications to the program in place, emigration from the island by newly translocated animals continued to be high.

During the third year of the program, 14 additional sea otters were translocated to San Nicolas Island, with the last translocation occurring on July 19, 1990 (USFWS 1991). By December of that year, the colony at the island was estimated to total 15 adult or sub-adult animals and three dependent pups.

No translocations occurred during the fourth year of the program because of difficulties encountered with implantation of radios in sea otters to be translocated to San Nicolas Island, an increased need for coordination amongst interested parties, and logistical constraints.

Following the fourth year of the translocation program, the sea otter population at the island was small, about 15 animals, but appeared to be stable. The sea otters that were present were consistently

observed at specific areas of the island, and it was hoped that these animals would become the founding nucleus of a larger colony. There were concerns that the introduction of additional translocated animals would disrupt the resident sea otters, possibly resulting in additional deaths or emigration from the island. Due to the perceived precariousness of the colony and concerns that translocation itself might affect the success of the colony, we discontinued the translocation of sea otters to San Nicolas Island. Since July 1990, no sea otters have been translocated to the island. However, we continued monitoring the sea otters remaining in the translocation zone. Sea otter surveys at San Nicolas Island are now conducted by the Biological Resources Discipline of the U.S. Geological Survey on a bimonthly basis.

Of the 140 sea otters released at San Nicolas Island between August 1987 and July 1990, the fate of 70 is known. Three were found dead at San Nicolas Island within a few days of being translocated. Thirty-six are known to have returned to the parent population range, and 18 were either captured (11) or found dead (7) in the management zone, months to years after they were translocated (Figure 4). At least 13 sea otters are thought to have remained at San Nicolas Island after their release. The fate of the other 70 animals is unknown. Although an intense effort was made to locate translocated sea otters at San Nicolas Island and in the management zone, observations of sea otters that returned to the parent population range were gathered only opportunistically. Despite the absence of a focused effort to identify translocated sea otters that returned to the parent range, many were resighted there, suggesting that additional sea otters may have returned to the parent range without being detected. We believe that most of the missing sea otters emigrated

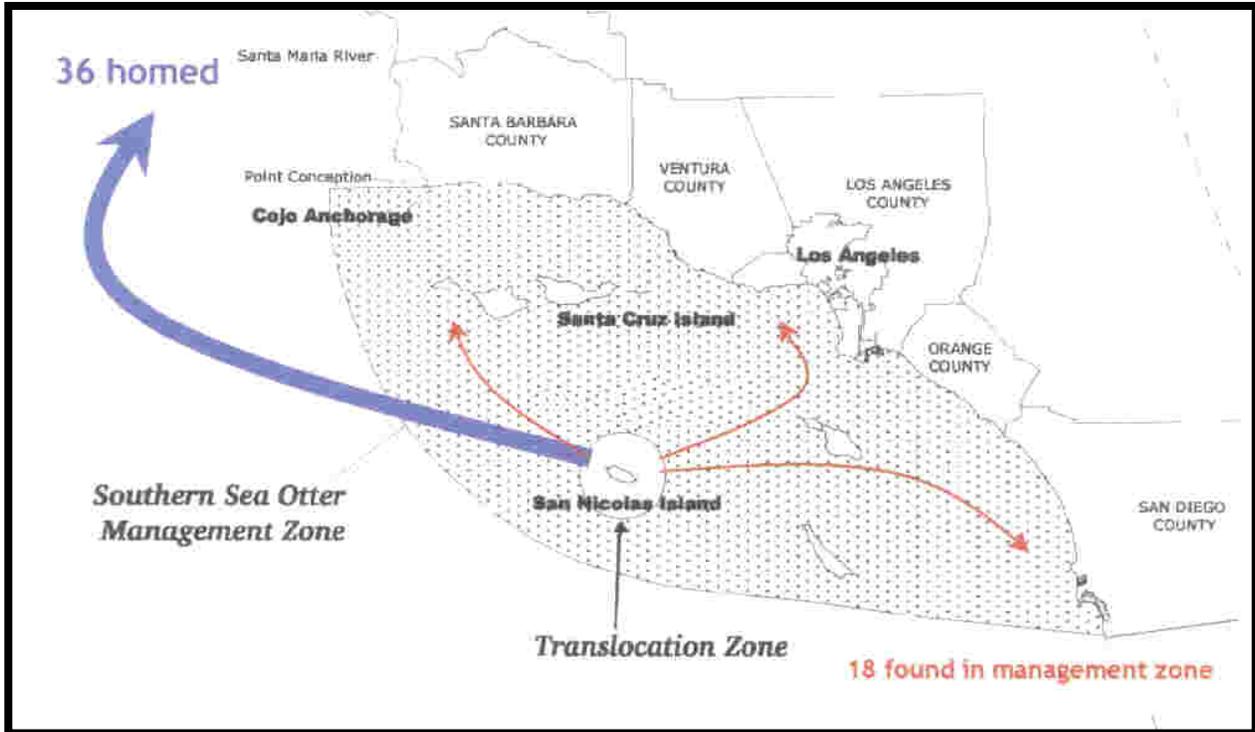


FIGURE 4. SEA OTTER EMIGRATION FROM SAN NICOLAS ISLAND.

from the island and that many of them probably returned to the parent population. Some of the missing animals may also have died as a consequence of translocation, but no additional deaths have been verified.

Containment Results

Southern sea otter containment was a cooperative effort between the Service and the California Department of Fish and Game. Containment efforts were intended to keep the management zone free of sea otters in accordance with P.L. 99-625 and our implementing regulations. Containment operations consisted of three interdependent activities: (1) surveillance of the management zone; (2) capture of sea otters in the management zone; and (3) relocation of captured sea otters to the parent range or San Nicolas Island.

Containment activities were triggered by sightings of southern sea otters in the

management zone. In most instances, these sightings were made by fishermen or local residents. Federal or State biologists investigated each reported sighting to confirm the presence of sea otters prior to launching capture efforts. The number of sea otter reports we received from people working, recreating, or living near the waters of the management zone varied from year to year, with the majority of the reports (37) received during the first year of the translocation program (USFWS 1988). In nearly all cases, the number of sea otters confirmed in the management zone was small, generally one to three animals. It is likely that some animals were reported multiple times while others transited the management zone without being detected. Sea otter sightings at San Miguel Island proved to be the exception. At San Miguel Island, groups of as many as nine sea otters were consistently observed in the vicinity of Point Bennett from 1991 to 1993.

Capturing southern sea otters in the management zone using non-lethal means proved to be relatively difficult, and our capture efforts were only minimally successful. Three capture techniques were available for southern sea otter containment: (1) dip netting; (2) the deployment of passive entangling nets; (3) and the use of diver-operated traps (Wilson traps). The use of Wilson traps operated by divers equipped with closed-circuit SCUBA proved to be the most effective technique. Sea otters in the management zone were most often found in kelp beds, a circumstance that effectively eliminated the dip-netting option and favored the Wilson-trapping option. Sea otters in the management zone were also typically found in low densities or were found in areas with large numbers of pinnipeds, making the use of entangling nets impractical. Upon responding to reports of sea otters in the management zone, we were often unable to locate the animals that had been sighted. Even when sea otters were found, capture efforts were successful only about half the time.

Once captured, sea otters were transported back to the parent range for release. Public Law 99-625 allowed sea otters captured in the management zone to be released in either the translocation zone or the mainland range, but when we considered our previous efforts to move sea otters to the island, we concluded that animals removed from the management zone would not likely stay at San Nicolas Island. We believed that sea otters originating from the island that had already left it once were likely to do so again. Additionally, sea otters had proven that they were capable of negotiating deep ocean channels and could travel much longer distances than previously anticipated. Thus, during our initial containment efforts,

we returned individual animals to their original capture sites on the central coast of California instead of releasing them back into the translocation zone.

However, the strategy of releasing sea otters at their original capture sites resulted, in most cases, in lengthy travel times and additional handling of the animals. To reduce this source of stress on captured sea otters, we revised our strategy in the belief that it was more prudent to release recaptured animals at more easily accessible sites in the northern portion of the parent range. This change reduced transport times and, we believed, reduced stress and improved the well-being of moved sea otters. We also hoped that releasing animals at the northern end of the range would reduce the likelihood that animals would return to the management zone because of the greater distances they would have to travel.

From December 1987 to February 1993, 24 sea otters were captured and removed from the management zone and returned to the parent range (Figure 5). Eleven of these animals had been translocated to San Nicolas Island, four were offspring of sea otters translocated to San Nicolas Island, and at least three swam into the management zone from the parent range. The origins of the remaining six animals were unclear; they had either moved down from the parent range or were offspring of sea otters translocated to San Nicolas Island. Two of the sea otters removed from the management zone returned to it after traveling hundreds of kilometers, only to be recaptured and moved again.

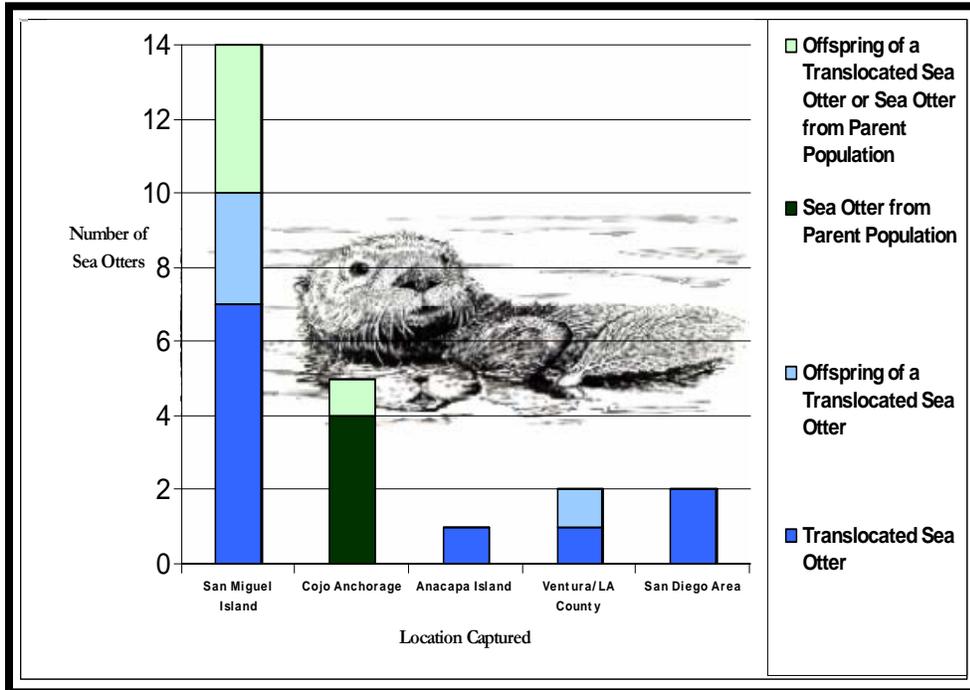


FIGURE 5. SEA OTTERS CAPTURED IN MANAGEMENT ZONE.

In February 1993, two sea otters that had been recently captured in the management zone were found dead shortly after their release in the range of the parent population. In total, four sea otters were known or suspected to have died within two weeks of being moved from the management zone. We were concerned that sea otters were dying as a result of our containment efforts; therefore, in 1993 we suspended all sea otter capture activities in the management zone to evaluate sea otter capture and transport methods. We also recognized that available capture techniques, which proved to be less effective and more labor-intensive than originally predicted, were not an efficient means of containing southern sea otters.

From 1993 to 1997, few sea otters were reported in the management zone, and there appeared to be no immediate need to address sea otter containment. In 1997, the California Department of Fish and Game notified us that it intended to end its southern sea otter research project and

would no longer be able to assist us if we resumed capturing sea otters in the management zone.

In 1998, a group of approximately 100 southern sea otters moved from the parent range into the northern end of the management zone. At the same time, range-wide counts of the species indicated a decline of approximately 10 percent

between 1995 and

1998. In light of the decline in southern sea otter numbers, we were concerned about the potential effects on the parent population of moving the large number of southern sea otters that had moved into the management zone. We asked the southern sea otter recovery team, a team of biologists with expertise pertinent to southern sea otter recovery, for their recommendation regarding the capture and removal of sea otters in the management zone. The recovery team recommended that we not move sea otters from the management zone to the parent population because moving large groups of sea otters and releasing them within the parent range would be disruptive to the social structure of the parent population (DeMaster 1998). We agreed with their recommendation.

In order to notify stakeholders of our intended course of action, we held two public meetings in August 1998. At these meetings, we provided information on the

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status of the translocation program, solicited general comments and recommendations, announced that we intended to reinitiate consultation under section 7 of the ESA for the southern sea otter containment program, and stated that we intended to begin the process of evaluating the translocation program against the failure criteria established for it.

We distributed a draft section 7 consultation on the southern sea otter containment program to interested parties for comment on March 19, 1999, and issued a final biological opinion on July 19, 2000. Our reinitiation of consultation was prompted by the receipt of substantial new information on the population status, behavior, and ecology of the southern sea otter that revealed adverse effects of containment that were not previously considered. In the biological opinion, we cited the following information and circumstances as prompting reinitiation: (1) in 1998 and 1999, southern sea otters moved into the management zone in much larger numbers than in previous years; (2) analysis of carcasses indicated that southern sea otters were being exposed to environmental contaminants and diseases that could be affecting the health of the population throughout California; (3) range-wide counts of southern sea otters indicated that numbers were declining; (4) recent information, in particular the observed effects of the Exxon Valdez oil spill, indicated that southern sea otters at San Nicolas Island would not be isolated from the potential effects of a single large oil spill; and (5) the capture and release of large groups of southern sea otters could result in substantial adverse effects on the parent population. The biological opinion concluded with an assessment that

continuation of the containment program would likely jeopardize the continued existence of the species on the grounds that (1) reversal of the southern sea otter's population decline was essential to the survival and recovery of the species, whereas continuation of containment could cause the direct deaths of individuals and disrupt social behavior in the parent range, thereby exacerbating population declines; and (2) expansion of the southern sea otter's distribution was essential to the survival and recovery of the species, whereas continuation of the containment program would artificially restrict the range to the area north of Point Conception, thereby increasing the vulnerability of the species to oil spills, disease, and stochastic events.

On January 22, 2001, we issued a policy statement regarding the capture and removal of southern sea otters in the designated management zone [66 FR 6649]. Based on our July 2000 biological opinion, we determined that the containment of southern sea otters was not consistent with the requirement of the ESA to avoid jeopardy to the species. The notice advised the public that we would not capture and remove southern sea otters from the management zone pending completion of our reevaluation of the southern sea otter translocation program, which would include the preparation of a supplement to our 1987 environmental impact statement and release of a final evaluation of the translocation program that contained an analysis of failure criteria.

Current Status of the Translocated Sea Otter Colony

In December 2004, 32 independent southern sea otters were counted at San Nicolas Island. Data from quarterly counts indicate that the population has fluctuated between 13 and 33 independent animals since July 1990. Dependent pups are frequently observed with these individuals. Within the past several years there have been indications of slow growth in the population that is almost certainly due to the birth and recruitment of pups (Table 1) rather than immigration of sea otters to the island. One southern sea otter pup was born at San Nicolas Island during the first year of the translocation program (1987-88), and new pups have been observed in each subsequent year. At least 90 pups are known to have been born at the island since the program's inception.

In 2004, we confirmed the presence of at least one sea otter at San Nicolas Island that had been translocated there. However, virtually all of the sea otters now residing at San Nicolas Island are the offspring of those originally translocated to the island. This is because the founding animals were translocated between 15 and 18 years ago, and the average life expectancy of southern sea otters in the wild is approximately 10 to 15 years (Riedman and Estes 1990).

Previous Evaluations of the Southern Sea Otter Translocation Program

From the beginning of the translocation program, the annual translocation reports included a discussion of failure criteria. As early as 1990 (USFWS 1990), these reports noted that the program appeared to meet failure criterion 2, under which the program would be considered a failure if fewer than 25 sea otters remained at San Nicolas Island.

However, a provision of failure criterion 3 allowed for continuation of the program if reproduction was occurring and dispersal into the management zone was small. We chose to continue monitoring the translocated colony. In subsequent years, three additional and more comprehensive internal reviews of the program were completed. Although each of the evaluations concluded that the translocation program was failing to meet its objectives, none resulted in a formal administrative finding that the translocation program had failed.

TABLE 1. POPULATION STATUS OF SEA OTTERS AT SAN NICOLAS ISLAND (SNI), 1987-2003

Year	# Released at SNI	# Born at SNI	Maximum # independent sea otters*
87	60	1	27
88	41**	1	28
89	35	3	28
90	4	5	14
91	0	8	14
92	0	4	13
93	0	6	12
94	0	5	16
95	0	3	14
96	0	6	17
97	0	5	16
98	0	3	15
99	0	4	21
00	0	6	21
01	0	7	27
02	0	8	29
03	0	8	33
04	0	7	32
Total	140	90	

*Totals given here exclude dependent pups and reflect the highest count made in each calendar year. Totals for 1987-1990 are adjusted upwards to include the number of sea otters released at the island in each of those years, even if a released sea otter was not subsequently seen.

**Includes one rehabilitated sea otter from Monterey Bay Aquarium.

Data source: Hatfield 2005, U.S. Geological Survey unpublished data.

Draft Evaluation of the Southern Sea Otter Translocation Program 1987-2004

1992 DRAFT WHITE PAPER—ZONAL MANAGEMENT AND SOUTHERN SEA OTTER RECOVERY

In March 1992, we prepared a draft “white” paper for a meeting with the California Department of Fish and Game (USFWS 1992). The paper included background material on the rationale for listing the southern sea otter as a threatened species, the recovery objective of the 1982 southern sea otter recovery plan, a summary of the translocation program, identification of major issues affecting sea otter recovery, and several options for the future of the southern sea otter translocation program. The draft white paper explored two major questions: (1) does the existing sea otter management zone interfere with recovery? and (2) is it feasible to maintain a management zone using non-lethal techniques? We noted that establishing a translocated sea otter population at San Nicolas Island had proven to be difficult and concluded, based on our experience with the *Exxon Valdez* oil spill in 1989, that even if the San Nicolas Island sea otter colony were to become established and result in a viable population, it might not provide significant protection to the species if a large oil spill were to come in contact with the parent population.

We considered three options for the future of the translocation program in the draft white paper: A) eliminate the management zone, allow sea otters to remain at San Nicolas Island, and allow sea otters to expand their range naturally; B) determine the translocation program to be a failure and attempt to remove sea otters from the translocation and management zones; or C) leave sea otters at San Nicolas Island and continue efforts to maintain the management zone. The paper also noted that elimination of the management zone would allow sea otters to expand their range naturally, thereby benefiting sea otter recovery. In

The 1992 Draft White Paper concluded:

Continuing containment activities (i.e. at San Miguel Island) may result in the removal of at least some, and possibly the remaining, sea otters. However, maintaining the management zone free of sea otters using non-lethal techniques ultimately will not work using current techniques. And as long as the southern sea otter is listed as threatened or endangered and population growth is essential to recovery, using culling techniques or techniques that reduce reproduction is unacceptable. Restoring the southern sea otter to a non-threatened, non-endangered status would be enhanced by the establishment of the San Nicolas Island colony and populations of otters south of Point Conception (currently the management zone) if recolonization occurs.

USFWS 1992

discussions between the Service and the State, the California Department of Fish and Game expressed its desire to maintain management options for sea otters. As a result, the white paper was never finalized, and no formal action was taken to declare the translocation program a failure.

1993 DRAFT EVALUATION

In 1993, three years after the last sea otter was released at San Nicolas Island, population surveys indicated that the number of sea otters at the island was not increasing. Prompted by this lack of growth, we prepared a draft evaluation of the translocation program (USFWS 1993).

Draft Evaluation of the Southern Sea Otter Translocation Program 1987-2004

The draft evaluation assessed the entire translocation program, including the status of the San Nicolas Island colony, translocation efforts and methods, containment efforts and methods, and failure criteria. We noted that the degree of dispersal of sea otters from San Nicolas Island and the mortalities associated with the program were both much higher than anticipated. Stress to sea otters associated with handling and release was thought to be a significant factor in these results.

Despite the fact that most of the translocated sea otters had apparently left the island, few animals settled in the management zone (11 of 140 translocated). Sea otter containment success up to that point was due to the presence of only small numbers of sea otters within the zone and the successful identification of key areas where sea otters tended to congregate, such as Cojo Anchorage and San Miguel Island. Although the effectiveness of capture operations was improved by the addition of divers equipped with closed-circuit SCUBA, the 1993 draft evaluation again questioned whether a non-lethal, zonal management program for sea otters was ultimately feasible.

The overall intent of the 1993 draft evaluation was to assess the translocation program and to determine whether the program met regulatory criteria to be declared a failure; however, the document had a limited distribution and was never finalized. When we discussed declaring the translocation program a failure with the California Department of Fish and Game, they requested that we continue the program to preserve the option of zonal management of sea otters in southern California to reduce conflicts with local shellfish fisheries. As a result, we deferred our decision on the translocation program.

2000 BIOLOGICAL OPINION

In 1998, large groups of male sea otters began to enter the management zone from the parent population. In subsequent years, this movement was determined to be seasonal in nature, with most sea otters entering the management zone in the winter months and returning to the parent range in spring (Tinker 2002, unpubl. data). The movements coincided with declining population counts throughout the range of the parent population, and the receipt of substantial new information led us to reinitiate consultation under the ESA. This consultation focused on the containment portion of the southern sea otter translocation program and sought to determine whether containment activities would impose additional adverse effects on the mainland population that were not considered when we developed the translocation plan. The resulting biological opinion was finalized in July 2000 (USFWS 2000).

After reviewing the status of the southern sea otter, the environmental baseline for the action area, the effects of sea otter containment, and cumulative effects, we concluded that continuation of sea otter containment would likely jeopardize the continued existence of the species. Our conclusion was based on two determinations: 1) reversal of the southern sea otter's population decline was essential to its survival and recovery, and continuation of sea otter containment could lead to deaths of sea otters and disruption of the social structure of the population, thus exacerbating the population decline; and 2) expansion of the southern sea otter's distribution was essential to its survival and recovery. Continuing sea otter containment would restrict the range of the species, resulting in its increased vulnerability to oil spills, disease, and stochastic events.

Upon completion of the biological opinion, we published a notice of policy regarding the capture and removal of sea otters from the designated management zone [66 FR 6649]. We determined that we would not capture and remove sea otters from the management zone pending our reevaluation of the translocation program, including the preparation of a supplemental environmental impact statement and release of a final evaluation of the translocation program.

Current Evaluation of the Translocation Program

Since the inception of the southern sea otter translocation program, we have been evaluating data, consulting with our primary partners (the California Department of Fish and Game and the Marine Mammal Commission), and making adjustments to the program. This latest draft evaluation compares our expectations for the program with results attained to date and provides analysis of the specific failure criteria identified in the translocation plan.

COMPARISON TO OTHER SEA OTTER TRANSLOCATIONS AND FUTURE OF THE SAN NICOLAS ISLAND POPULATION

Experimental translocation of sea otters began in 1951. Initially, there were several attempts to move relatively small numbers of northern sea otters in Alaska. All early attempts failed, largely due to high mortality associated with a general lack of knowledge about how best to transport sea otters. A series of northern sea otter translocations occurred from 1965 to 1972. During this period, 708 northern sea otters were translocated from the Aleutian Islands and Prince William Sound, Alaska, to the Pribilof Islands, southeast Alaska, British Columbia, Washington, and Oregon (Jameson *et al.* 1982).

Translocations to southeast Alaska, British Columbia, and Washington were eventually

successful, while those to the Pribilof Islands and Oregon failed (Riedman and Estes 1990). In all cases, post-release dispersal of sea otters was evident (Estes *et al.* 1989). Considering previous translocation efforts, Jameson *et al.* (1982) concluded the following: 1) the number of sea otters at a transplant site decreases dramatically soon after release; 2) emigration appears to be an important factor in the initial decline of translocated populations; 3) small populations (<25-30 animals) are probably destined for extinction because they are incapable of reproducing at a rate that is greater than the combined rates of mortality and emigration; 4) it is possible to select a general area to reestablish sea otters, but the exact locations are difficult to predict; and 5) it is possible to reestablish sea otters in unoccupied habitat, but it appears to require a relatively large nucleus population.

The southern sea otter translocation program is the most recent and the most extensively planned of all sea otter translocations. Capture and transport techniques were thought to be sufficiently developed to minimize mortalities; the number of sea otters to be translocated was considered sufficient to establish a colony rapidly in unoccupied habitat; and the selected translocation site, San Nicolas Island, was surrounded by deep ocean channels and thought to be situated sufficiently far from shore to minimize emigration and dispersal (USFWS 1987). In retrospect, our expectations for success were overly optimistic. Our results to date indicate that the southern sea otter translocation program has followed the same general pattern of all previous sea otter translocations. Initial emigration from San Nicolas Island was high, leaving a small colony that may or may not persist.

The future of the sea otter colony at San Nicolas Island is uncertain. The colony has exhibited a pattern of early emigration and subsequent growth that appears to be roughly intermediate between the patterns seen after translocations of northern sea otters to Washington and Oregon. Although these translocations had similar beginnings, they had very different outcomes (Figure 6). While the Washington population has grown to a relatively large size (about 740 animals in 2004), the Oregon population has gone extinct.

The size of the San Nicolas Island population has remained far below that projected under the translocation plan. Like other small populations, the colony at San Nicolas Island is vulnerable to the effects of demographic and environmental variability. These sources of unpredictability make it difficult to forecast the future of the colony

based on existing trends or the example of other translocated populations. One important distinction must also be made between this and all earlier translocations: the designation of a management zone is unique to the San Nicolas Island translocation. Should the colony at San Nicolas Island survive, efforts to maintain a management zone will impede population growth if animals straying from the island are consistently removed from the population.

GOALS AND OBJECTIVES OF THE SOUTHERN SEA OTTER TRANSLOCATION PROGRAM

The goals identified in the 1987 Southern Sea Otter Translocation Plan are: (1) to recover the southern sea otter from its present 'threatened' status under the ESA; and (2) to gain a better understanding of characteristics of a sea otter population and the marine ecosystem when the sea otter

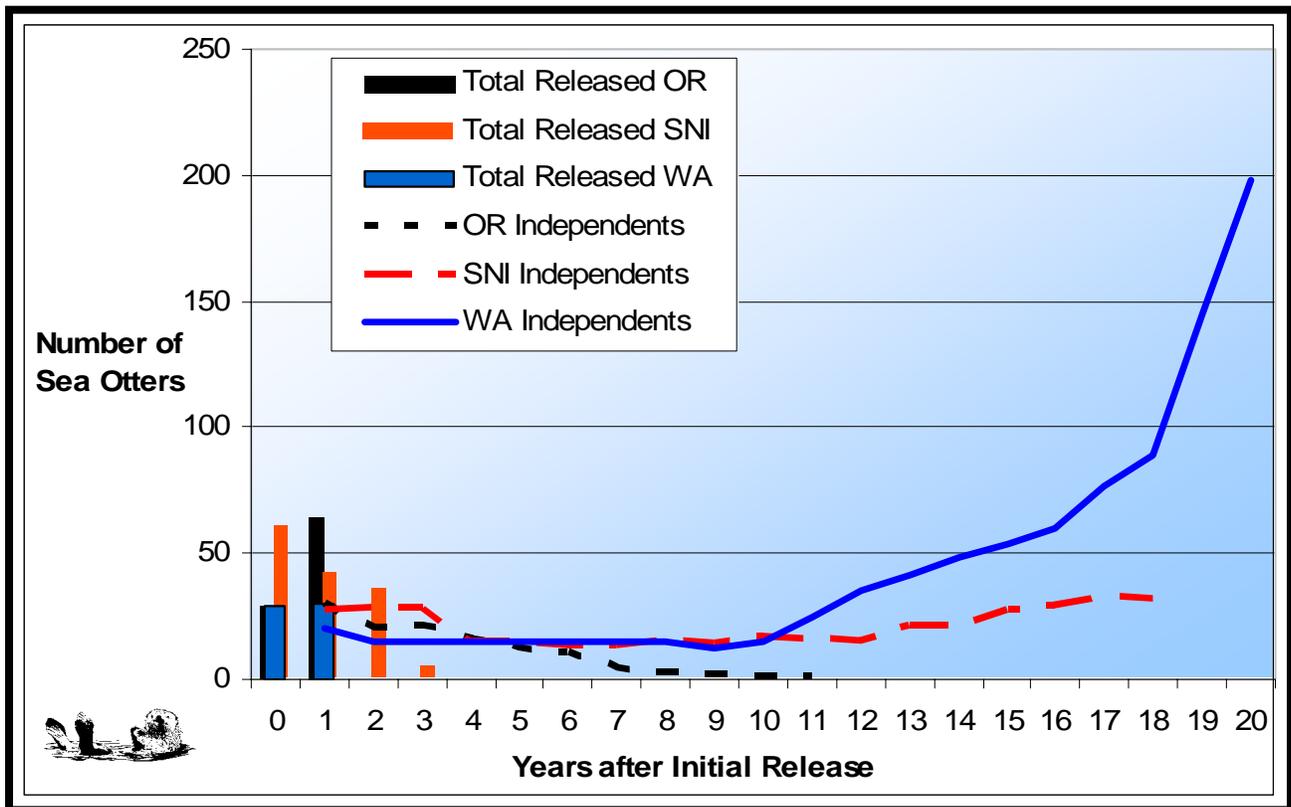


FIGURE 6. FATE OF TRANSLOCATED POPULATIONS IN WASHINGTON, OREGON, AND CALIFORNIA.

population is within range of its optimum sustainable population, as defined by the MMPA. Research associated with the translocation was designed to achieve the following objectives: (1) to understand southern sea otter population dynamics, in particular growth-limiting factors; (2) to understand the ecology of southern sea otter foraging and the role of southern sea otter predation in biological communities in central and southern California waters; (3) to develop methods for translocating southern sea otters; and (4) to evaluate and develop methods for containing southern sea otters. This research was undertaken in the context of competing management demands: to protect and conserve southern sea otters, on one hand, and to understand and manage conflicts between sea otters and shellfish fisheries on the other. These were the principal forces behind the joint management/research translocation program put in place in 1987 under the auspices of the ESA, the National Environmental Policy Act (NEPA) process, and P.L. 99-625. To date, we have gathered a significant amount of data to assess capture, transport, reintroduction, and containment techniques. However, our primary recovery objective for the southern sea otter translocation program remains unfulfilled.

In the context of the goals stated in the southern sea otter translocation plan, the creation of an established southern sea otter population at San Nicolas Island does not appear to be achievable. The plan defines an “established” population as one that is not only reproductively self-sustaining but allows for the repeated removal of individuals for the reestablishment of another southern sea otter population in the parent range should a catastrophic event occur in the parent range. The logic underlying this definition is explained in our final rule for the establishment of an

experimental population of southern sea otters:

The Service does not consider the mere presence of sea otters in the translocation zone an indication that a new population is established. If a catastrophic event were to decimate a portion of the parent population, it is possible that the relocated otters could be used to restore the damaged portion of the parent population; however, it would also likely eliminate the value of the new population to serve as a reserve colony for providing stock to restore subsequently damaged areas and it could eliminate the reproductive viability of the colony such that the remaining animals could not be self-sustaining. Therefore, to be considered established it must be a reproductively viable unit, capable of maintaining itself even if 25 animals are removed each year for 1 to 3 years or replacement yield is sufficient to maintain the experimental population at or near carrying capacity during the post-establishment and growth phase or carrying capacity phase for the purposes of repairing damage to the parent population [52 FR 29754; August 11, 1987].

Two circumstances make achievement of this objective unlikely. First, the future of the San Nicolas Island colony is uncertain. Its consistently small population size makes it difficult to predict when or if the population will become established. Second, if the San Nicolas Island colony does become established (with a population size of 150 southern sea otters and an annual recruitment of 20 animals), our experience with the translocation of southern sea otters

to San Nicolas Island indicates that if a catastrophic event were to affect the parent population, it is unlikely that we would be able to reestablish a viable southern sea otter population by moving 25 animals from San Nicolas Island annually over a 3-year period. The high emigration apparently inherent in sea otter translocations and the small number of animals available to be moved would make it unlikely that a core population could become established in the damaged area.

RELATION OF THE TRANSLOCATION PROGRAM TO SOUTHERN SEA OTTER RECOVERY

The original Southern Sea Otter Recovery Plan (USFWS 1982) identified the need to establish one or more southern sea otter colonies through translocation in order to minimize the possibility that a major oil spill or series of smaller spills could jeopardize the species. The intent behind translocation was to enhance the southern sea otter's range and population size. A slow rate of population growth, evident in the mid- to late 1980s, was viewed as inadequate to expand the southern sea otter range rapidly enough to ensure the survival of the species should a spill occur. These factors led to the development of the plan to establish a second colony of southern sea otters through translocation from the central coast of California to San Nicolas Island.

The Revised Southern Sea Otter Recovery Plan (USFWS 2003) identifies several factors that have altered the need and rationale for the translocation program. The change in recovery strategy is the result of direct and indirect experience gained since publication of the original recovery plan.

First, the *Exxon Valdez* oil spill in 1989 confirmed some of the most pessimistic projections of the consequences of such events. The spill was uncontrollable and in

30 days spread over 670 kilometers (400 linear miles), an area greatly exceeding the present range of the southern sea otter in central coastal California plus that of the translocated colony at San Nicolas Island. The distance over which oil rapidly spread during the *Exxon Valdez* disaster indicates that the translocated colony at San Nicolas Island could not provide a reasonable safeguard against an oil spill of this magnitude. Moreover, it is estimated that several thousand sea otters died in the *Exxon Valdez* oil spill (Garrott *et al.* 1993, DeGange *et al.* 1994), a number at least equaling and probably exceeding the present size of the southern sea otter population. Efforts to save and rehabilitate oiled sea otters were of little or no value to the population (USFWS 2003).

Second, the translocation of southern sea otters to San Nicolas Island has not achieved its goal of establishing a second, self-sustaining population of southern sea otters. To date, our expectations for the translocation program are far from being met (Figure 7).

Finally, maintenance of a management or "no-otter" zone would hinder southern sea otter recovery. Large numbers of southern sea otters (50 to 150 animals) have been observed frequenting the northern end of the management zone since 1998. These animals appear to move into and out of the zone seasonally from areas along the mainland to the north. Recent research indicates that these southern sea otters are moving great distances throughout the southern sea otter range and are an important component of the population (Tinker 2002, unpublished data). Capture and relocation of these animals exposes them to increased mortality and may result in widespread disruption of the southern sea otter population as a whole (USFWS 2000).

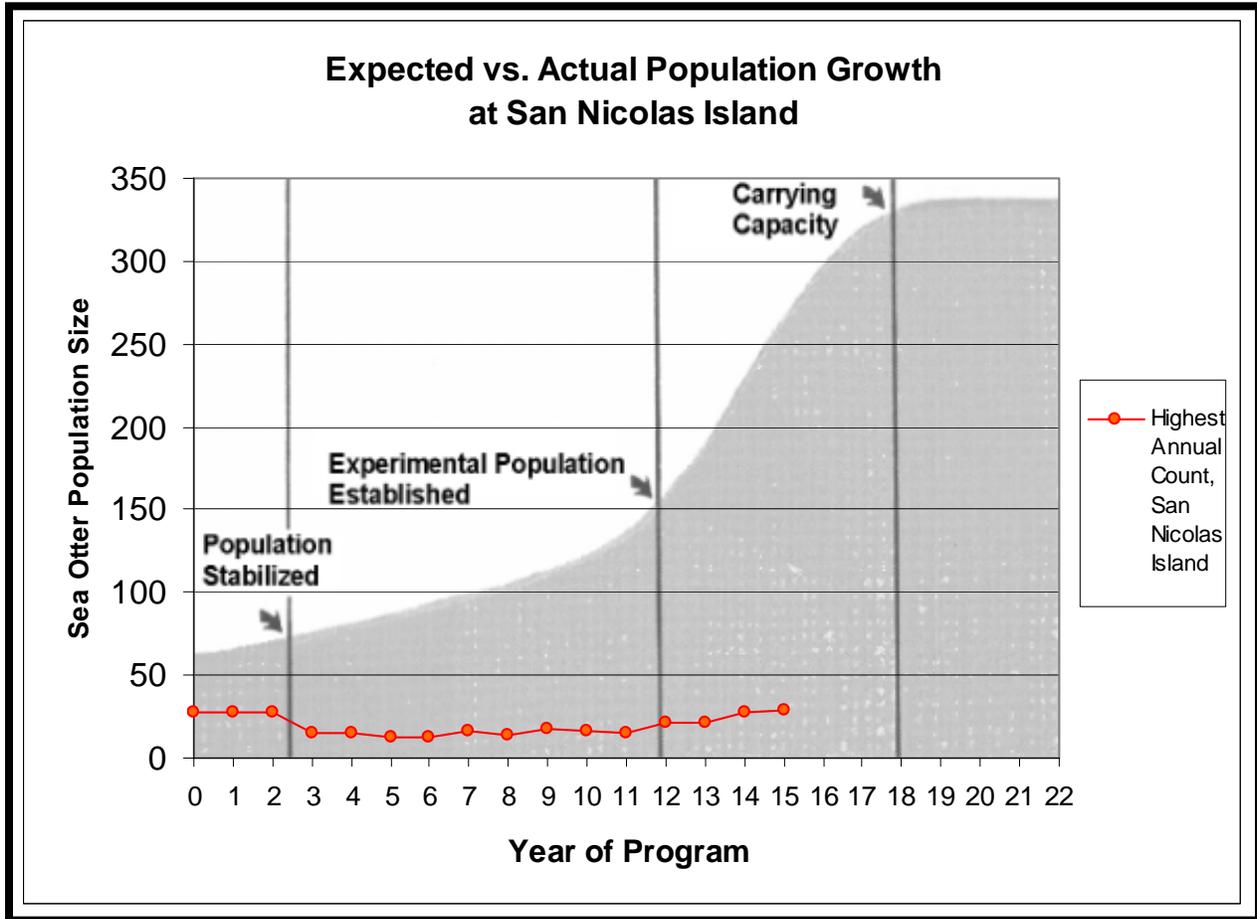


FIGURE 7. EXPECTED VS. ACTUAL POPULATION GROWTH AT SAN NICOLAS ISLAND.

The revised recovery plan of 2003 acknowledges that the intent and purpose of the translocation program have not been met. The current strategy for recovering the southern sea otter, as reflected in the revised recovery plan, is to determine causes of increased mortality in the parent population, to mitigate these causes, and to allow the number and range of southern sea otters to increase naturally to such a size that: (1) there will be enough survivors to recolonize the range without genetic bottleneck effects in the event of a major oil spill in central coastal California; and (2) a declining trend in abundance can be detected with adequate statistical assurance prior to the population reaching the threshold for endangered status. The revised recovery plan also states that a primary action for promoting the recovery of

the southern sea otter at this time should be the cessation of zonal management, and that without such a change in management, the likelihood of recovery is significantly lessened (USFWS 2003). Continuation of zonal management may result in the direct deaths of individual animals removed from the management zone and disrupt social behavior in the parent population to a degree that animals residing in the range of the parent population will have a reduced potential for survival and recovery. Zonal management will also artificially restrict the range of the southern sea otter and perpetuate the species' vulnerability to the adverse effects of oil spills, disease, and stochastic events (USFWS 2000).

SEA OTTER CONTAINMENT

Our experience implementing the translocation program revealed that detecting and confirming the presence of sea otters in the management zone was more difficult in practice than in theory. Because of the large area involved [more than 750 linear miles (1,200 km) of coastline] we were dependent on fishermen, local residents, and others to provide reports of sea otter sightings. The quality of such reports varied considerably, and at times the presence of animals could not be verified despite multiple reported sightings. At other times, a sea otter sighting was confirmed, but the animal left the area before a capture attempt could be organized.

Capture operations were also more complicated than anticipated. Sea otter captures in the management zone most often involved divers using Wilson traps and closed-circuit rebreathers in place of conventional SCUBA equipment. This capture technique proved to be effective but labor intensive, and success was largely dependent on the skills of individual divers (Sanders and Wendell 1991). Initially, we expected that this technique would be sufficient to maintain the management zone free of sea otters, but we did not account for the decrease in efficiency that occurred when the targets of capture operations were small numbers of sea otters spread over hundreds of miles of coastline. The logistical arrangements necessary to mount a capture operation were considerable regardless of how many sea otters were being targeted. Often the target of an operation was a small group of sea otters or even a single individual. If the capture attempt failed, there was little recourse but to wait for another opportunity once the animal(s) settled down. In contrast, when we captured sea otters for translocation to San Nicolas Island, we had access to large

numbers of sea otters that offered multiple capture opportunities. If one group of sea otters dispersed, capture efforts could be easily shifted to another group nearby.

In addition to underestimating the difficulties involved in capturing sea otters, we underappreciated their physical capabilities and drive to return to their home range. It is clear that the deep ocean channels surrounding San Nicolas Island did not pose a barrier to sea otter movements as we initially believed they would. We now know, based on the resightings of translocated sea otters in the mainland range of the parent population and the return of southern sea otters removed from the management zone, that southern sea otters are eminently capable of traversing long distances and navigating to the areas where they were originally captured.

Despite the fact that capture operations in the management zone were arduous and relatively ineffective, the potential for harm to the animals themselves was ever-present. At least four southern sea otters died within two weeks of being removed from the management zone and released in the mainland range of the parent population. Although one animal was a very old male, as evidenced by his tooth wear, body size, and general condition, and one animal was a dependent pup transported with its mother, the other two were young, prime-aged animals in good health at the time of capture. We were unable to determine the precise cause of death in these animals, but we are concerned that their capture and relocation was a significant factor. We surmise that these animals, captured in areas with low southern sea otter densities and rich food resources, were unable to survive when released in unfamiliar areas with moderate southern sea otter densities and relatively sparse food resources. In light of

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the stress-related deaths of southern sea otters captured for translocation to San Nicolas Island, we cannot discount the possibility that the individual susceptibilities of sea otters to stress may have also played a role in these mortalities.

ASSESSMENT OF FAILURE CRITERIA IDENTIFIED IN TRANSLOCATION PLAN

Public Law 99-625 authorized southern sea otter translocation and provided requirements for a southern sea otter translocation plan should we pursue the creation of a translocation program. The legislation did not address the possibility of the program's failure. As a consequence, it did not specify criteria that would be used to determine whether the program had failed, nor did it recommend actions that should be taken in the case of failure. When we developed the translocation plan and implementing regulations for the program, we received public comment asking us to define what constituted failure of the program and what actions we would take if the program failed. We responded by delineating specific failure criteria in the 1987 Translocation Plan [52 FR 29754; August 11, 1987].

The purpose of the failure criteria was to identify circumstances under which we would generally consider the translocation program to have failed. The five failure criteria were defined before any translocations of southern sea otters were undertaken and without the benefit of what we know today about the translocation, containment, and recovery needs of southern sea otters. The criteria focus on the status of the translocated population and, in hindsight, clearly do not address all the circumstances that are relevant to a complete evaluation of the program. For example, the failure criteria do not address the possibility that containment might not be successfully

accomplished because of southern sea otters entering the management zone from the mainland range of the parent population rather than from the experimental population at San Nicolas Island. The failure criteria also do not address the possibility that the founding population of the San Nicolas Island colony might be fewer than 70 animals, or even the possibility that an "established" population at San Nicolas Island, defined in our regulations, may be insufficient to attain the recovery goals established for the program. We believe that, ultimately, failure is determined by our ability or inability to attain the objectives of the translocation program, which are clearly set out in our final rule for the establishment of an experimental population of southern sea otters [52 FR 29754; August 11, 1987].

In this draft evaluation of the southern sea otter translocation program, we find that the translocation program meets failure criterion 2 as defined in the original 1987 translocation plan. We also find that the translocation program meets, in spirit, failure criteria 3 and 4. A summary of our analysis of each failure criterion is given below.

Criterion 1: If, after the first year following initiation of translocation or any subsequent year, no translocated otters remain within the translocation zone, and the reasons for emigration or mortality cannot be identified and/or remedied;

Criterion 1 has not been met. Sea otters have been observed in the translocation zone at San Nicolas Island every year since the beginning of the program.

Criterion 2: *If, within three years from the initial transplant, fewer than 25 otters remain in the translocation zone and the reason for emigration or mortality cannot be identified and/or remedied;*

Criterion 2 has been met. Within 3 years of the initial transplant (August 1990), a maximum of 15 adult (or sub-adult) sea otters resided in the translocation zone. We chose not to declare the translocation program a failure at that time because southern sea otters were reproducing, dispersal into the management zone had abated, and the California Department of Fish and Game expressed a desire to continue zonal management of southern sea otters. During the subsequent years, the colony has fluctuated and is showing signs of slow growth. For 11 of the 15 years (including 1990), the number of sea otters at the island remained below 25. The high count for 2004 was 32 adult (or sub-adult) sea otters. The future of the colony remains uncertain, despite the fact that 18 years have passed since the initial translocation.

The emigration of southern sea otters from San Nicolas Island is the primary cause of failure under this criterion. Although high rates of dispersal were seen in all earlier sea otter translocations (Estes *et al.* 1989), we believed that the translocation to San Nicolas Island would not result in the significant dispersal of animals because of the abundance of prey items, the apparent suitability of the habitat, and the perceived barrier imposed by the surrounding deep water. After the first year of translocation, we made substantial changes to the program with the intent of minimizing or eliminating emigration [53 FR 37577; September 27, 1988]. These changes were implemented during the second year of the program, when

we selected younger sea otters for translocation, transported sea otters more quickly and in smaller groups, abandoned the use of holding pens at the island, and released newly translocated sea otters in the vicinity of sea otters already residing at the island. Despite our efforts, none of these changes appeared to result in a decrease in emigration. In the final year of the translocation effort, we attempted to gain more information on sea otter movements by implanting radio transmitters in sea otters immediately prior to their transport to San Nicolas Island. Two of the initial three southern sea otters that received implants died before they could be transported to the island, causing us to abandon this effort.

While emigration appears to be the obvious cause of the initial declines of sea otters at San Nicolas Island, we have considered whether high rates of mortality could be an additional factor in the failure of the colony to become established. At least 90 southern sea otter pups have been born at the island, but only about 32 sea otters resided there in 2004. At first glance, these numbers appear to support the contention that pups are dying at an elevated rate. When the numbers are viewed in context, however, they suggest a different conclusion. Because southern sea otters normally live about 10 to 15 years in the wild, we assume that the majority of the 32 southern sea otters now at the island are offspring of the original translocated sea otters. If we assume a founding population of 13 adults at San Nicolas Island (the maximum number of sea otters counted in 1992 and 1993 and the lowest numbers recorded at the island following completion of the translocation effort) and apply a mortality rate for first-year pups consistent with what we have observed in the parent population (about 40 to 50 percent), account for some level of natural pre-reproductive mortality, and consider the possibility that

some pups could have been weaned at the island but then emigrated elsewhere, we would not expect to have many more sea otters at the island than we currently have. Because of high emigration, we failed to create a founding population of 70 animals. Instead, our founding population appears to have numbered as few as 13 animals, and not all of these animals may have reproduced. Subsequent growth and recruitment into the population has naturally been slow. Subtle shifts in mortality rates and/or emigration rates disproportionately affect small populations, a fact that may ultimately result in the loss of the sea otter colony at San Nicolas Island.

There has been considerable speculation about whether the fishing gear set at San Nicolas Island, most notably lobster traps, represents a significant source of mortality for the southern sea otter colony. No sea otters have been observed in lobster traps at San Nicolas Island, and our ability to detect mortalities is severely limited by our ability to track individual animals and monitor fishery interactions. We recognize the potential that southern sea otters could become trapped and drown in lobster traps. However, the recent, albeit slow, growth of the sea otter colony suggests that, if trap mortality is occurring, it has not prevented recruitment into the colony.

The fact that the translocation program has failed under criterion 2 does not necessarily mean that the sea otter colony at San Nicolas Island is destined to disappear. The future of the San Nicolas colony is uncertain. It appears unlikely, however, that the colony will ever be large enough to supply the numbers of sea otters that would be needed to perform a successful translocation to the mainland range if the parent population were reduced or eliminated by a catastrophic event.

Criterion 3: If, after two years following the completion of the transplant phase, the experimental population is declining at a significant rate, and the translocated otters are not showing signs of successful reproduction (i.e. no pupping is observed); however, termination of the project under this and the previous criterion may be delayed, if reproduction is occurring, and the degree of dispersal into the management zone is small enough that the effort to remove otters from the management or no-otter zone would be acceptable to the Service and the affected State;

We are unable to evaluate whether the program has failed under criterion 3, taken literally, because we never reached the minimum number of sea otters at San Nicolas Island required to complete the transplant phase of the program. The translocation plan defines the transplant phase as ending when there are at least 70 healthy southern sea otters of mixed ages and sexes within the translocation zone and we determine that the population is increasing due to natural reproduction. Although we translocated twice this number, we never achieved the requisite core population of 70 animals. From a practical perspective, however, the transplant phase ended when the last sea otter was translocated to the island in 1990. The population declined at a significant rate from the program's inception in 1987 to 1992, at which time the number of independent sea otters at the island was 13. Although pups were observed from 1987 to 1992, there appeared to be little or no recruitment into the population. There were far fewer sea otters at the island in 1992 than the minimum number (25) required to avoid a declaration of failure under failure criterion 2; however, under provisions of failure

criterion 3 we could delay termination of the program because pupping was occurring. The experimental population has fluctuated in number since 1992 and now appears to be increasing slowly; reproduction continues to occur. The rate of dispersal from the island is unknown, but we now know that the deep ocean channels surrounding the island do not present a barrier to dispersal. Although pupping is occurring, it is not clear that the San Nicolas colony will survive. If the colony does survive, it will have been founded on a small subset of the core number of 70 healthy sea otters of mixed ages and sexes that were intended to found the population, a fact that has implications for the genetic makeup of the resulting population.

Criterion 4: If the Service determines, in consultation with the affected State and the Marine Mammal Commission that sea otters are dispersing from the translocation zone and becoming established within the management zone in sufficient numbers to demonstrate that containment cannot be successfully accomplished. This standard is not intended to apply to situations in which individuals or small numbers of otters are sighted within the management zone or temporarily manage to elude capture. Instead it is meant to be applied when it becomes apparent that, over time (one year or more), otters are relocating from the translocation zone to the management zone in such numbers that: 1) an independent breeding colony is likely to become established within the management zone or 2) they could cause economic damage to fishery resources within the management zone. It is expected that the Service could make this determination within a year, provided that sufficient information is available;

Technically, criterion 4 has not been met. This criterion clearly specifies that the program would be declared a failure if sea otters moved from the *translocation zone* and became established in the management zone. The criterion does not strictly apply if animals immigrate into the management zone from the *parent range*. Nevertheless, we believe that from a practical perspective the spirit of criterion 4 has been met. Beginning in 1998, large groups (50 to 150 individuals) of sea otters have seasonally moved into the management zone from the parent range. Although there is no evidence of a permanent breeding colony in the management zone, commercial fishing interests contend that local shellfish populations available to the fishery have been reduced by the presence of these sea otters.

The difficulties associated with sea otter capture and transport, our concern for the welfare of animals removed from the management zone, the adverse effects of sea otter containment on the parent population, and the adverse effects on fisheries are concerns regardless of whether sea otters enter the management zone from the parent range or from San Nicolas Island. Although criterion 4 is specific and applies only to sea otters originating from San Nicolas Island, our experience with sea otters entering the management zone from either the parent range or the translocation zone indicates that successful containment of sea otters, or maintenance of an “otter-free” management zone, cannot be accomplished by simply capturing animals in the management zone and moving them to another location.

Criterion 5: If the health and well-being of the experimental population should become threatened to the point that the colony's continued survival is unlikely, despite the protection given to it by the Service, State and applicable laws and regulations. An example would be if an overriding military action for national security was proposed that would threaten to devastate the colony and the removal of otters was determined to be the only viable way of preventing loss of the colony.

colony were to become established, the resulting population would not likely be sufficient to ensure survival of the species should the parent population be adversely affected by a widespread catastrophic event. Recovery of the southern sea otter will ultimately depend on the growth and expansion of the southern sea otter's range. Although we recognize that there are conflicts between an expanding sea otter population and fisheries that have developed in the absence of sea otters, zonal management of sea otters has proven to be ineffective and compromises the ability of the species to recover.

Criterion 5 has not been met. The experimental population at San Nicolas Island, although small and vulnerable, has persisted. There are no proposed Federal, State, or local actions that threaten to devastate the colony. The Department of Defense is responsible for the majority of human activity at San Nicolas Island. They have conferred with us and given consideration to southern sea otters when developing projects at San Nicolas Island. To date, no projects have posed a threat to the colony.

Conclusion

The primary purpose of the southern sea otter translocation program was to bring southern sea otters closer to recovery and eventual delisting as a threatened species. Based on our evaluation of the translocation program against the goals for which it was undertaken and the failure criteria established for its assessment, we conclude that the translocation program has failed to fulfill its purpose and that our recovery and management goals for the species cannot be met by continuing the program.

The San Nicolas Island sea otter colony is small, and its future is uncertain. Even if the

Glossary

carrying capacity: the point at which the population reaches a state in which the numbers of animals remain relatively constant and in balance with the available food supply (estimated as a minimum of 280 animals for San Nicolas Island, but believed to be as high as 400-500 animals)

established population: a translocated population at San Nicolas Island that meets the following criteria: (1) an estimated combined minimum of 150 healthy male and female sea otters residing within the translocation zone; (2) little or no emigration into the management zone occurring; and (3) minimum annual recruitment of 20 sea otters

experimental population: any southern sea otter found within the translocation zone or the management zone

failure determination: a determination that the translocation program has failed to produce a viable, contained experimental population at San Nicolas Island based on an evaluation of specific failure criteria given in 50 CFR § 17.84 (d)(8)

management zone: an area from Point Conception to the Mexican border that surrounds the translocation zone and from which sea otters are required to be non-lethally removed (as long as a translocation zone exists) according to the provisions of PL 99-625

parent population: the population of southern sea otters existing along the central California coast north of the management zone

Public Law 99-625: a law enacted on November 7, 1986 authorizing the translocation of southern sea otters and requiring the specification of a translocation zone and a management zone as part of any proposed translocation plan

translocation zone: the area surrounding San Nicolas Island within which the experimental population of southern sea otters was released and is required to be contained

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